A REPORT ON THE INCREASING GAP BETWEEN AMERICA'S INFRASTRUCTURE NEEDS AND OUR ABILITY TO PAY FOR THEM

HARD CHOICES

A Summary Report of the National Infrastructure Study Prepared for the Joint Economic Committee of the United States Congress

February 1984

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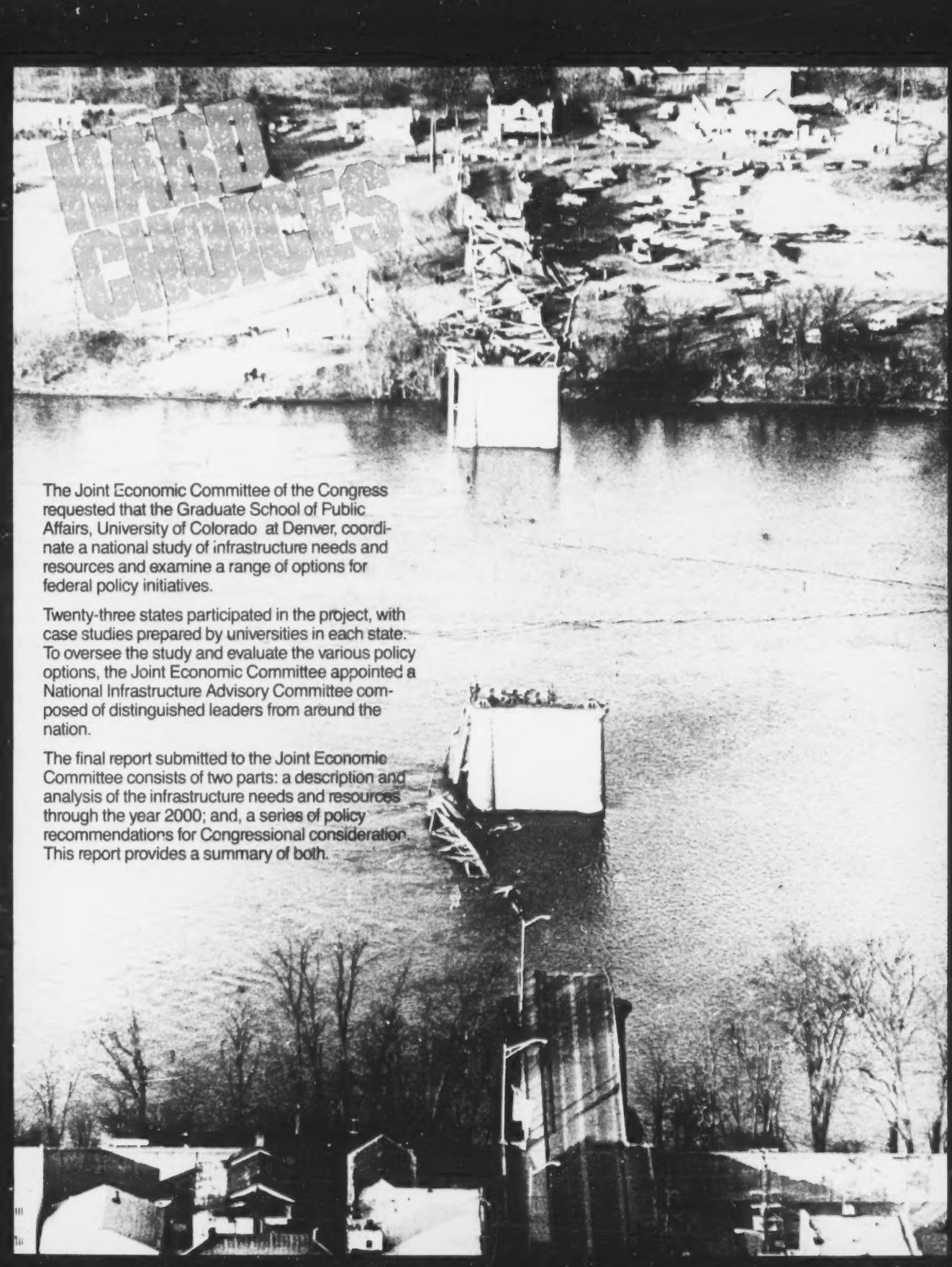

The Joint Economic Committee of the Congress requested that the Graduate School of Public Affairs, University of Colorado at Denver, coordinate a national study of infrastructure needs and resources and examine a range of options for federal policy initiatives.

Twenty-three states participated in the project, with case studies prepared by universities in each state. To oversee the study and evaluate the various policy options, the Joint Economic Committee appointed a National Infrastructure Advisory Committee composed of distinguished leaders from around the nation.

The final report submitted to the Joint Economic Committee consists of two parts: a description and analysis of the infrastructure needs and resources through the year 2000; and, a series of policy recommendations for Congressional consideration. This report provides a summary of both.

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The 1967 collapse of the Silver Bridge between West Virginia and Ohio was instrumental in the establishment of the federal bridge inspection program which, in turn, revealed a national problem of major proportions.

HARD CHOICES

The word "infrastructure" is a term that describes the basic network of facilities that drive our economy: our transportation, water and wastewater systems.

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As many frustrated public officials have observed, people generally don't care about the state of the nation's infrastructure.

Perhaps.

But people *do* care when a major highway caves in due to disrepair, paralyzing part of the transportation system of a major city.

People *do* care when a water storage system is so archaic and overtaxed that the slightest trauma causes it to collapse, leaving thousands without running water.

People *do* care, when for lack of adequate roads and water facilities, major industries move away from the community, leaving hundreds without jobs.

In an era of competition for limited public resources, it has become expedient for public officials to delay necessary capital improvements, to eliminate expenditures for maintenance, and allocate these funds to other, more immediate needs.

But, inexorably, hundred-year-old water lines are quietly deteriorating, bridges and roadways are approaching the end of their designed life, and changes in population patterns are placing enormous stress on systems in high-growth states.

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When a system that all citizens rely upon and take for granted collapses, or is inadequate to meet future needs, the impact is far greater than an engineering problem in search of a solution. It creates a sense of public unease, a belief that society is incapable of handling its most basic needs. In this sense, people *do* care, very passionately, about the state of the nation's infrastructure. And in referenda this past fall across the country, people showed they cared by voting at the ballot box for a near record proportion of capital programs to develop and rebuild their life support systems.

Yet, the inability to adequately address the infrastructure needs of the nation constitutes a major problem that seriously threatens our economic and physical well-being.

With virtually every level of government facing either major revenue shortfalls or significant unmet needs, the temptation to further postpone addressing this situation is great. It is time to measure the need, to understand that investment in our capital stock must be a priority to help keep our economy competitive and sustain our quality of life, to support the efforts of state and local governments to mobilize and finance infrastructure programs and to define what the role of the federal government in this national effort should be.

This report suggests that some hard choices have to be made, today, about meeting our nation's infrastructure needs of the future. There's a bill coming due. We should start to pay now, or we'll have to pay a lot more later.

A MANAGEABLE CRISIS

That a substantial portion of the nation's basic, publicly-financed infrastructure systems is inadequate is no longer a matter of debate.

Some observers, defining the problem at its most extreme, place the costs of restoring and expanding the current network of systems as high as three trillion dollars ($3,000,000,000,000), a figure so enormous as to make the entire problem seem absurd.

The assumption behind the recommendations in this study is that *the nation which built the greatest network of roads and waterworks in the world has not suddenly become incapable of maintaining and improving such a system.*

By setting priorities, by defining the problem in realistic terms, by utilizing the resources of federal, state and local governments, and by invoking the historic partnership between public and private sectors that helped build this great system, an approach to dealing with the revitalization of our infrastructure can be developed that is neither prohibitively expensive nor unmanageable.

This report has made no attempt to minimize the scope of the problem. *But it has also not minimized the creativity and resources available to develop a long-range, workable solution.*

The bottom line is that the problem is solvable, that the solutions are manageable, and that the time to start is now.

THE SCOPE OF THE PROBLEM

This report, two years in the making, is not the first to address the nation's infrastructure needs. It breaks new ground, however, because of its focus on state and regional needs and because of its effort to aggregate these needs into national totals through the year 2000. The report clearly demonstrates that infrastructure problems are common to *all* regions of the country.

The bottom line is that the problem is solvable, that the solutions are manageable, and that the time to start is now.

To obtain this state and regional viewpoint, twenty-three states were studied to determine their current levels of needs and expenditures in four key areas: wastewater collection and treatment, water supply and delivery, roads and bridges, and other transportation facilities (mass transit, airports, etc).

Additionally, the states were surveyed concerning their future needs, up till the year 2000, and their projected capital sources.

The results of this survey pointed to several noteworthy conclusions:

1. The problem is *national in scope.* It is not limited to any region or state.
2. The problem is *manageable.*
3. The problem requires *state and local governments to continue to assume primary management and funding responsibilities.*
4. The problem requires a *long-term response and commitment by the federal government.*

A NATIONAL PROBLEM

The total national infrastructure gap between revenues and needs through the year 2000 is over $400 billion. It stems from many different kinds of problems in the various states and regions. For example:

- In Oklahoma, water from the Ogallala Aquifer is being consumed for agricultural use faster than nature can replenish it.
- In Maine, 63 per cent of the highways are determined to be in need of immediate improvements.
- In Alabama, 53 per cent of the county maintained bridges are structurally deficient or functionally obsolete.
- In Oregon, only 14 per cent of the population is served by facilities providing secondary wastewater treatment.

In state after state, the immediate and projected infrastructure needs are considerable, and the gap between capital expenditures and capital needs is growing.

Clearly, we are witnessing a problem that is national in scope.

But within each region, and even within each state, the needs and the scope of the problem differ significantly.

In many of the older industrial areas of the nation, deterioration and obsolesence of existing systems threaten the opportunity for long-term economic revitalization.

For the rapidly-growing areas, the infrastructure gap stems from the demands placed by an ever-growing population.

But while the problems may differ, the gap between needs and financial resources in all areas of the country is substantial.

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PROJECTED U.S. INFRASTRUCTURE NEEDS, RESOURCES AND SHORTFALLS/ 1983-2000

(in billions of 1982 dollars)

	NEEDS	RESOURCES	SHORTFALLS
HIGHWAYS AND BRIDGES	$ 720	$455	$265
OTHER TRANSPORTATION	178	90	88
WATER SUPPLY AND DISTRIBUTION	96	55	41
WASTEWATER COLLECTION AND TREATMENT	163	114	49
TOTALS	$1,157	$714	$443

Transportation

Of the nation's 565,000 vehicular crossings, some 45% are deficient or obsolete.

The single most dominant need across the country is for investment in highways and bridges. The construction of much of the nation's highway network over the last several decades has been funded largely by the federal government. However, much of the nation's highway mileage is not on the federal-aid highway system and responsibility for reconstruction and maintenance of the entire network has largely been shouldered by state and local governments. This total highway network is aging. The needs facing state and local governments are growing, as evidenced by the fact that more than one half of the nation's two million miles of paved roads require immediate attention and over one third of the Interstate highway system is in need of repair.

While the nation's highways show substantial need, bridges pose an especially serious problem. Of the nation's 565,000 vehicular crossings, some 45% are either deficient or obsolete. These problem bridges exist throughout the country. The Federal Highway Administration estimates that in 34 states at least one third of the bridges require substantial renewal.

As a result, the projected highway and bridge needs through the year 2000 approach $720 billion. Even though federal and state gas tax levies have been increased in recent years, the projected shortfall is estimated at $265 billion.

On a regional basis, the greatest highway needs are projected for the Midwest. But the needs in all regions are substantial.

An increasing number of communities around the nation are looking to existing or planned public transportation facilities to move high volumes of people to growing business areas, both as a way to reduce highway congestion and to support economic development efforts. Costs here are also high and resources scarce.

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Water Supply and Distribution Systems

Developing reliable expenditure figures for water storage, treatment and distribution is complicated by the variety of entities providing these services. In New Jersey, for example, a large share of the responsibility for water delivery is assigned to private water companies. Washington State has over 8000 separate water systems, while Massachusetts has 363 separate water supply systems, of which 68 are private companies, 78 are fire and water districts, and 217 are municipal water departments.

Regardless of the type of organization relied upon, certain common problems were identified:

- Deterioration of water supply and distribution systems
- Inadequate sources of water supply
- Overdrafting of underground aquifers
- Contamination of water supply
- Inadequate treatment facilities.

Overall, water needs are projected to be nearly $100 billion through the year 2000, suggesting a shortfall in available capital of more than $40 billion.

On a regional basis, increasing water supply is the predominant concern of the South-Central and Western regions, while the Northeast and Midwest need to protect their supplies and rebuild aging distribution systems.

Wastewater Collection and Treatment

Since the passage of the Federal Water Pollution Control Act of 1972, the Environmental Protection Agency has been actively involved in assessing sewerage collection and treatment needs.

EPA's assessment process categorizes both backlogged needs (cost required to deal with existing pollution problems) and year 2000 needs (based on future population growth). Many states rely on EPA-derived figures to determine their sewerage treatment needs. Several states, however, believe that the EPA evaluation method may understate the dimension of the problem since all categories of need are not necessarily included.

Based on the figures reported by the states, the overall national need by year 2000 is projected at nearly $165 billion, and the anticipated shortfall in the neighborhood of $50 billion.

The greatest needs to accommodate today's population are in the Northeast and Midwest regions, but the population growth in the West and Sunbelt states is increasing the pressure to expand capacity in those areas.

Upper photo: Overdrafting of ground aquifers can result in the calamity of subsidence.

Lower photo: Inadequate sewage and stormwater collection systems ofter cause backups and destructive flooding conditions.

THE STATES' DILEMMA

While all the states surveyed projected substantial revenue shortfalls to meet their specific infrastructure problems, their abilities to cope with these challenges differ significantly.

•At the most basic level, many states are only beginning to devise a coherent, comprehensive approach to identifying their capital needs and developing a plan to meet these demands.

Capital planning is further complicated by restrictive laws and regulations governing each state as well as by constraints imposed by the federal government.

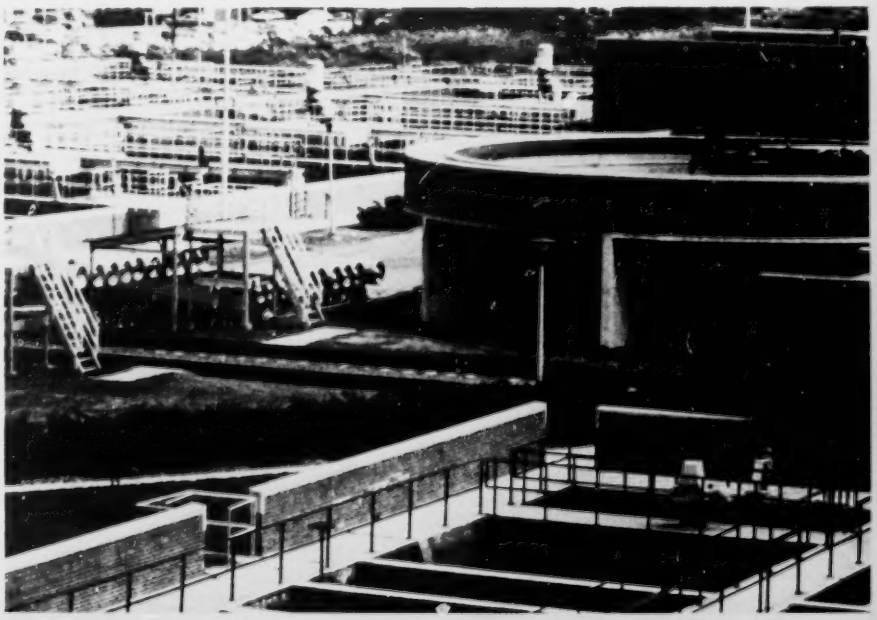
Some examples:

- Many states have statutory or constitutional debt and tax limitations that constrain funding available for long-term projects.
- Ambiguity about the federal government's role in infrastructure development impedes efficient infrastructure planning and development strategies.
- Uncertainty about proposed modification of tax-exempt bond mechanisms makes it difficult to develop cost-effective financing strategies for capital construction.

One important problem is the varying capacity of states to cope with their infrastructure problems due to the health of their local economies. This creates a Catch-22 effect. Many state and local governments that could benefit most from economic development opportunities by building more efficient transportation, water and wastewater systems lack the fiscal capacity to initiate these projects on their own.

To solve this dilemma, it will take the collective effort of all levels of government and the private sector to put in place the necessary planning and financing mechanisms.

Many state and local governments that could benefit most from economic development opportunities by building more efficient transportation, water and wastewater systems lack the fiscal capacity to initiate these projects on their own.



THE FEDERAL RESPONSE

State and local governments should, and undoubtedly will, continue to have the primary role in infrastructure management, financing and development. But it must be recognized that the federal government, by setting construction standards, by co-financing projects, by setting tax policy, and by defining needs, to a large extent influences the options available to the states.

And from the states' perspective, the federal government's policies toward infrastructure development are a source of considerable uncertainty and confusion.

With these considerations in mind, the Advisory Committee proposes that Congress address the question of federal infrastructure policy using the following guidelines:

1. Federal policy should recognize the inter-relationship between infrastructure development and the attainment of national economic goals.

In other words, federal assistance is appropriate when state and local governments by themselves have insufficient capital capacity to finance infrastructure projects that are essential to fulfilling national goals concerning economic competitiveness, productivity and basic quality of life.

2. Federal policy should recognize the implications of federally-initiated mandates for state and local governments.

The federal government sets standards in areas like clean water and interstate highway maintenance. Fairness suggests that the federal government continue to play a role in providing financial assistance in areas where the states must shoulder additional expenses to meet uniform national standards.

...federal assistance is appropriate when state and local governments by themselves have insufficient capital capacity to finance infrastructure projects that are essential to fulfilling national goals...

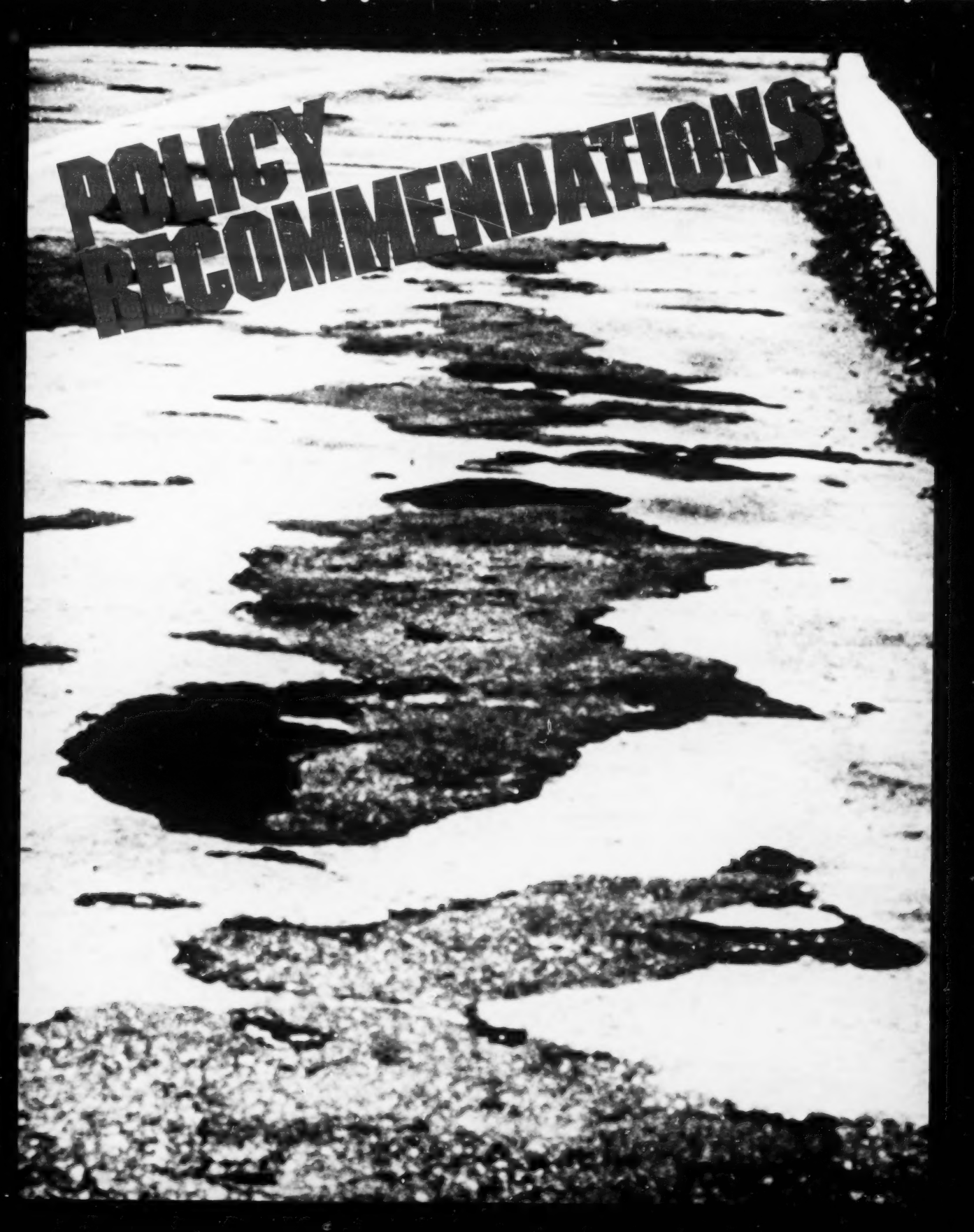
3. Federal policy should recognize that infrastructure problems are not confined to state boundaries.

Water pollution and traffic congestion do not respect state lines. Quite often, infrastructure problems are regional in scope and require regional solutions. Developing regional solutions is an appropriate area for federal involvement.

The Need for a Policy

Though Congress is cognizant of the infrastructure problem and has moved in several functional areas to respond, a clearly articulated, long-term federal policy on this issue would provide an improved climate for state and local infrastructure planning and investment.

The following recommendations, drawn from this study, are intended to help Congress deal with this vital issue.


POLICY
RECOMMENDATIONS

Recognizing the growing interest in Congress to address these critical national problems, and at the same time recognizing the need to live within our fiscal realities, the National Infrastructure Advisory Committee is urging Congress to consider four basic recommendations for modifying the current federal approach to infrastructure development. These recommendations are designed to expand the resources available for infrastructure and to improve our ability to manage capital programs at all levels of government.

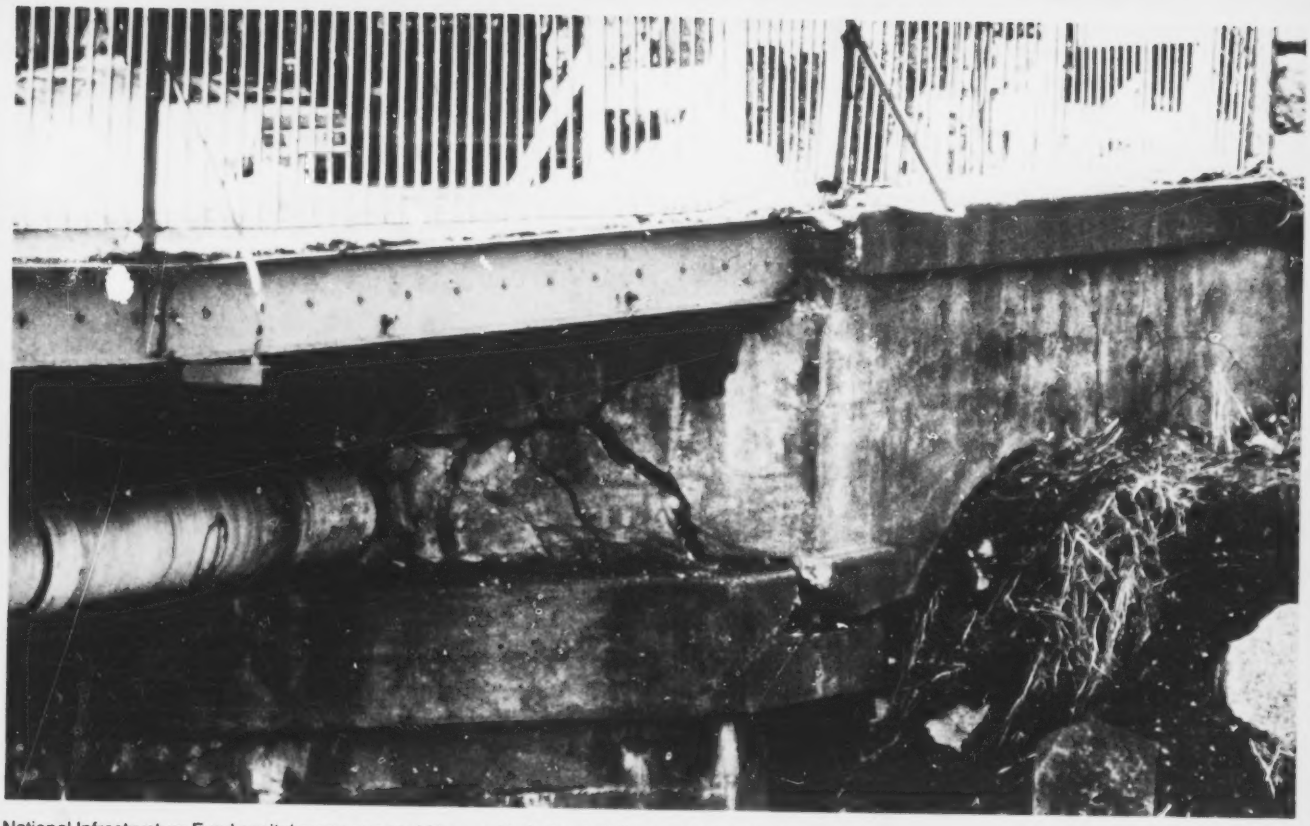
■ **RECOMMENDATION I:** Congress should establish a "National Infrastructure Fund" to supplement resources available under existing federal, state and local infrastructure capital programs.

■ **RECOMMENDATION II:** Congress should mandate the creation of a coordinated national infrastructure needs assessment program and, within the unified budget, require that capital expenditures be presented and highlighted in a clear, comprehensive way.

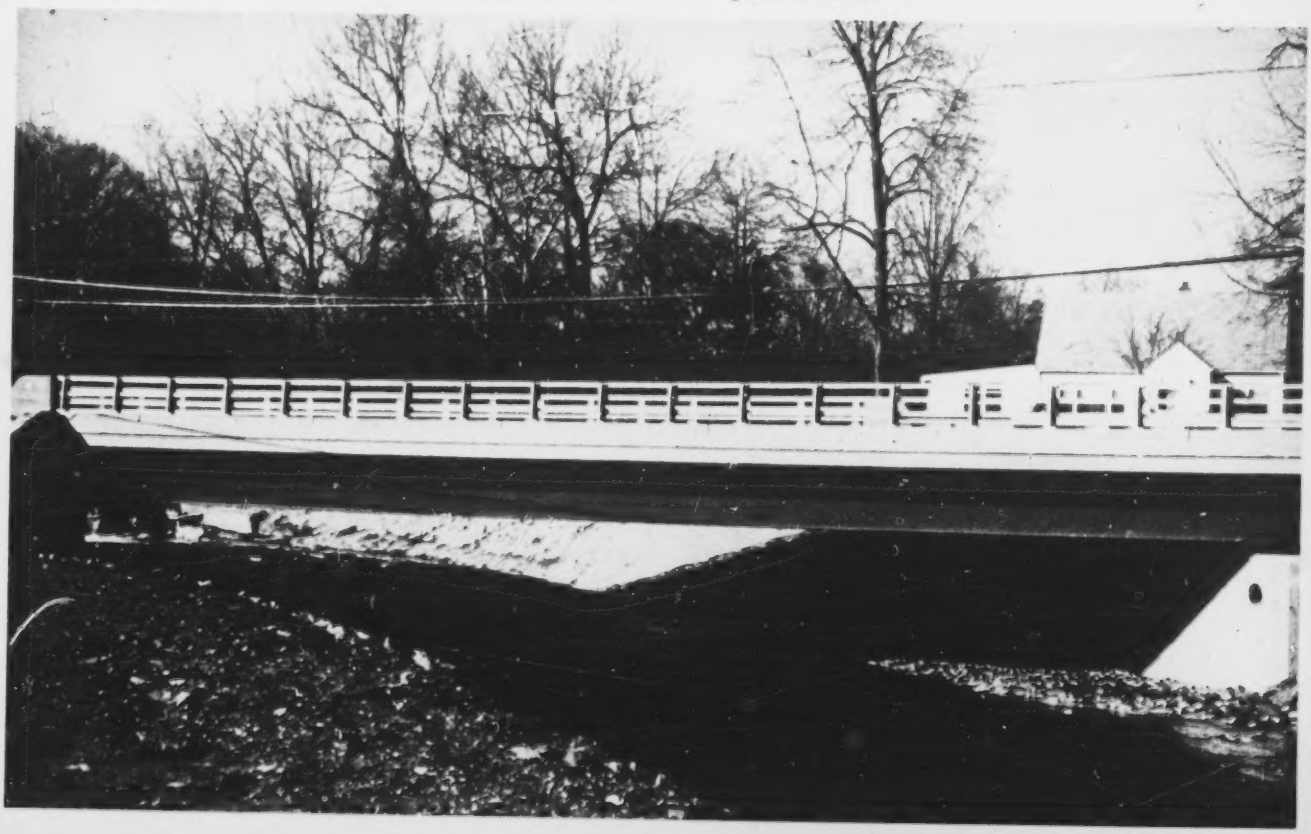
■ **RECOMMENDATION III:** Congress should initiate a review of technical standards now governing construction of the nation's roads, bridges, transit systems, water and wastewater facilities.

■ **RECOMMENDATION IV:** Congress should carefully re-evaluate the statutory and administrative rules that govern the use of existing federal infrastructure assistance programs.

Implementation of these four recommendations would pave the way for an effective partnership between the federal government and state and local governments to meet the infrastructure challenge and enhance the competitiveness of the national economy between now and the year 2000.



National Infrastructure Fund capital resources could be used to help rehabilitate existing infrastructure...

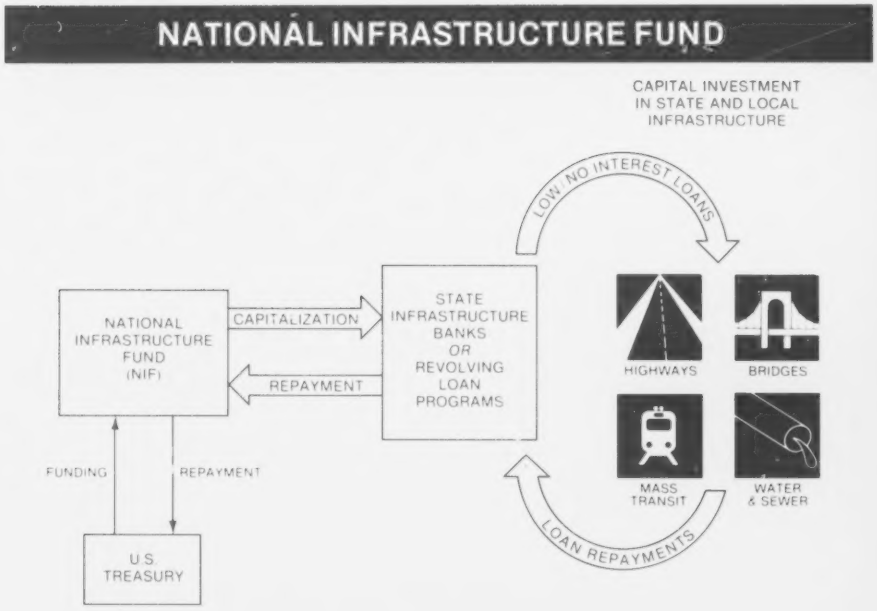


RECOMMENDATION I: CREATING NEEDED CAPITALIZATION MECHANISM

The infrastructure capital needs identified by the National Infrastructure Study are significantly larger than the resources expected to be available. Therefore, any realistic approach to meeting these needs will invariably require an increased level of commitment from all levels of government. Within that context, the Advisory Committee examined a number of different approaches for increasing the level of federal financial support. They ranged from simply increasing the level of current grant programs to encouraging innovative public/private mechanisms to establishing new funding partnerships with state and local governments. (Some of these approaches have already been presented to Congress in previous sessions and deserve further consideration.) The approach most favored by the Advisory Committee calls for the creation of a new National Infrastructure Fund.

National Infrastructure Fund (NIF)

The use of tax-exempt bonds and pay-as-you-go financing are the traditional methods by which state and local governments fund capital construction programs. These financing methods, however, are not adequate to meet current infrastructure needs, not to mention the challenge of the future projected needs described in this report. Increasingly, state and local government capital budgets are strained by competing demands, high real interest rates, statutory and constitu-



NATIONAL INFRASTRUCTURE FUND

tional debt limitations and, in some instances, the realities of fiscal capacity. New ways of raising capital funds have to be found.

A new federally-chartered National Infrastructure Fund would raise money by selling taxable bonds directly in the private market or through the Federal Financing Bank. It would leave undisturbed the financial resources of the tax-exempt capital market. Congress would determine NIF's ultimate size and scope.

The revenue created would be used to capitalize state infrastructure financing institutions, such as state infrastructure banks. These entities would then provide funds to support state and local infrastructure programs.

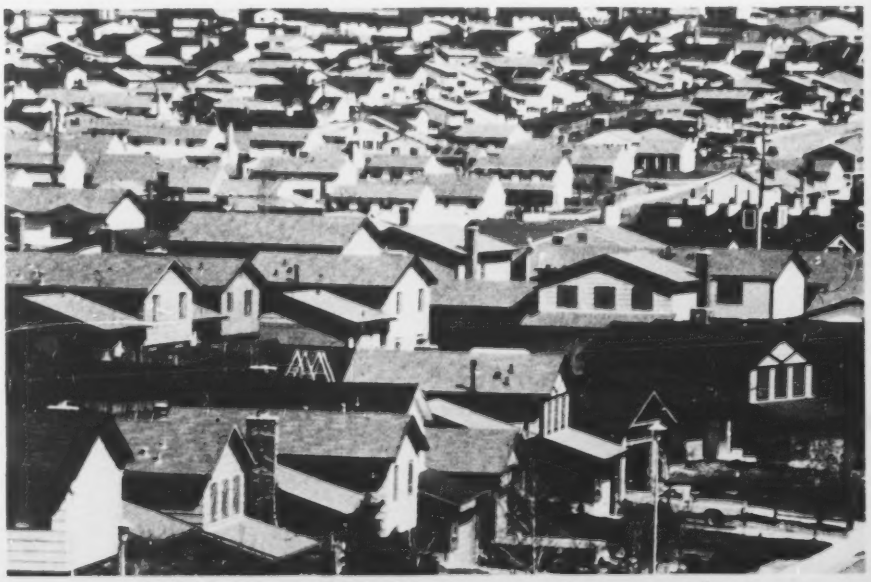
If Congress provided for the payment of interest on the NIF debt, then NIF could provide the states with interest-free capital. States could then finance, on a revolving fund basis, specific infrastructure projects chosen by state and local officials from among eligible infrastructure categories, e.g., roads, bridges, mass transit, water and sewer. The actual assistance could be accomplished in a variety of ways, using a range of interest rates or other financing mechanisms.

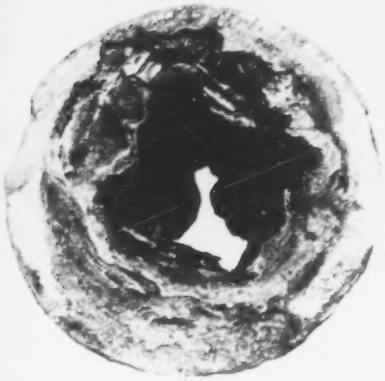
The capital provided by NIF ultimately would be repaid by state and local governments from taxes or user fees. But until the bonds issued by NIF came due for repayment, state and local government units could recycle NIF capital to fund additional projects.

Because state and local governments would ultimately provide the funds to repay the NIF debt, the primary cost to the federal government would be the payment of the interest expense. And as this debt would not be tax-exempt, the federal treasury would not be deprived of taxes on the interest paid.

This approach would permit a large program of infrastructure projects to be financed within the constraints of the federal budget. It would provide the nationwide infrastructure effort with a sustained, predictable multi-year level of federal financing.

...or NIF could finance new infrastructure for rapidly growing areas.





Clogging of pipes and spalling of bridge support piers are two forms of infrastructure deterioration that go unnoticed by most.

RECOMMENDATION II: BUILDING AN ASSESSMENT AND CAPITAL BUDGETING CAPACITY AT THE FEDERAL LEVEL

A major obstacle to developing a coherent approach to solving the infrastructure problem is that no one has known, with any degree of accuracy, the magnitude and nature of the needs nor the extent of the resources devoted to capital development programs. No forum currently exists for examining and debating, in a comprehensive way, how the federal government should support capital construction efforts and how the need for capital infrastructure investment should weigh against other claims on the public fisc.

For example, current budgeting practices hide direct and indirect federal infrastructure contributions, blur federal infrastructure objectives, and make it difficult, if not impossible, to assess the full impact of federal actions in this area. The extremely fragmented information base at all levels of government further compounds this situation.

As one would expect, these circumstances inhibit implementation of coordinated and efficient management and investment strategies at the federal level. They also make it difficult for state and local governments to mesh their short and long range plans with federal infrastructure actions.

How can we develop improved federal capacity? The Advisory Committee recommends the creation of a national infrastructure inventory and assessment process and the preparation of an annual analysis of federal capital expenditures.

Assessing Needs

The findings of this study on state and regional needs are considered threshold estimates, a base on which to build a continuing and more refined national assessment process.

The type and quality of available data gathered during this study varied considerably as did state-by-state definitions of needs and resources.

To establish a truly consistent measure of needs on a national scale, common definitions and consistent methodologies will be needed. Congress should foster development of a national assessment process that can accurately and continuously monitor changing needs and changing circumstances.

Within the context of basic national criteria, state-by-state information

should be collected on a regular and systematic basis and provided to the Congress in the form of an annual infrastructure audit.

Federal Budget Capital Expenditure Analysis

No easy, clear way now exists to measure the full extent of federal commitment to infrastructure investment. The federal government, through a variety of investment strategies, provides considerable support for infrastructure development. But it is impossible to determine which approaches are most effective. The Advisory Committee urges Congress to assure that capital expenditures are separated from current operation outlays within the unified federal budget. Congress can then debate and set capital priorities clearly and deliberately.

This would be the first step in a process of analyzing federal infrastructure expenditures within the context of the overall capital policy objectives established by Congress.

This is not a new concept, but it has yet to be implemented. Failure to put the federal budget in a more rational, understandable order will limit the ability of state and local governments to define and move forward with their own infrastructure strategies.

Undermining of roadways can occur without warning and lead to major disruptions.

RECOMMENDATION III: RE-EVALUATING STANDARDS

In order to participate in most federal-aid programs for capital infrastructure development, states and localities must comply with stringent federally-mandated technical construction standards. In many cases, they stretch out construction schedules and add to costs.

Perhaps this is appropriate when the "Feds pick up the bill." But in some situations these standards appear unreasonable and unrelated to local needs. Unquestionably, they have an impact on the overall cost of a given construction project.

The historical development of these federal infrastructure standards, while in the health and safety interests of the nation, has been determined more by interested professional groups than by consumers.

Concern for public safety, quite properly, has to be a principal justification for these mandated standards. But weight should be given to other considerations such as the economic, social and environmental costs.

The Advisory Committee urges Congress to initiate a comprehensive study of federal standards governing development of basic infrastructure programs, using a prestigious and neutral body such as the National Academy of Sciences.

Concern for public safety ... has to be a principal justification for these mandated standards.

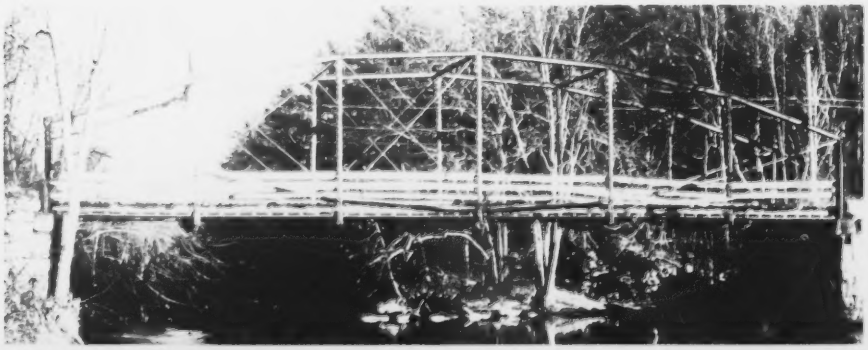
The study would measure the relevance of current mandated standards in light of changing social values and real resource constraints.

The study should:

- inventory federal standards in key infrastructure categories;
- analyze the relationship of these standards to those employed by state and local governments;
- evaluate the impact these standards have on the costs of infrastructure projects; and
- analyze the opportunity costs as well as the health, safety and environmental risks associated with reducing or changing standards.

But weight should be given to other considerations such as the economic, social and environmental costs.

The bill for infrastructure development is high enough without having to pay for facilities which are designed to standards which may no longer be appropriate. This undertaking might help reduce the gap between state and local needs and anticipated revenues.



RECOMMENDATION IV: DEVELOPING MORE FLEXIBLE GRANT PROGRAMS

...federal infrastructure programs...still favor construction over maintenance activities.

In the course of developing these recommendations, the members of the Advisory Committee listened to the concerns of many governors and mayors. A common theme was the need for a review of the guidelines and laws governing existing federal grant programs.

Clearly, many would prefer maximum flexibility with respect to the use of federal funds. Some of the concerns expressed included:

–"We should not be limited to historically defined infrastructure categories...we should be able to use the total provided in a manner responsive to our needs and priorities and not Washington's."

–"We cannot use some grant programs easily as loans. We cannot allocate funds in some programs to readily leverage private sector monies...We are pressured to use or lose funds."

–"While we have more flexibility than in the past...federal infrastructure programs...still favor construction over maintenance activities."

Faced with these expressions of frustration and concern, an important strategy for Congress to consider would be a re-examination of the statutory and regulatory constraints inhibiting efficient state and local government use of existing infrastructure assistance programs. This could help to move projects faster and thus lower overall costs.

In an era of scarce resources at all levels of government, easing the restrictions on the use of these funds, within general statutory guidelines, could free up existing funds and increasingly allow them to be used to address state and local priorities.

The Advisory Committee has endorsed the general principle that state and local governments should be permitted greater latitude with respect to the use of existing grant funds.

"Safe-harbor" leasing of transit vehicles provided substantial and sorely needed benefits to many public transportation operators.

SOME THOUGHTS ABOUT TAX REFORM

State and local governments rely principally on funds raised through the tax-exempt market to finance capital infrastructure investments, using general obligation bonds, revenue bonds and industrial development bonds (IDBs). In recent years, Congress has become increasingly concerned about the growing use of IDBs for what may be considered private purposes. Legislation is currently under consideration that not only would severely restrict the use of IDBs for all purposes but would place arbitrary "cap" limitations on tax-exempt issues.

The Advisory Committee believes that it is desirable to limit the use of tax-exempt bonds to truly legitimate public purposes. In this context, however, no arbitrary restrictions should be placed on the scope, dollar value or character of tax-exempt issues that clearly respond to public policy concerns, particularly those related to the provision of basic infrastructure.

STATE AND LOCAL CONSIDERATIONS

The dominant focus of this report has been on changes to federal infrastructure policy.

But this report would be less than complete if it did not acknowledge some of the areas where state and local governments could improve the way they approach infrastructure investment.

Many of the states are suffering from unrealistic and overly-constrained attempts to manage budget issues through the use of across-the-board tax or budget limitations. If the states are going to meet their long-term infrastructure needs, they are going to have to develop appropriate long-term financing strategies, and not expect to solve infrastructure problems with year-by-year, "quick fix" remedies.

Similarly, if the states are going to fulfill their side of the federal-state partnership, they are going to have to augment their capacity to inventory and analyze their own infrastructure needs, and to define and carry out coordinated and innovative capital investment and maintenance programs.

The bottom line is that the infrastructure needs of the nation through the year 2000 are enormous. Local, state and federal governments owe it to the public to address the problem as realistically and efficiently as possible. The stakes are too high to allow any less.

Those living downstream from aging dams face potential disaster.

Local, state and federal governments owe it to the public to address the problems as realistically and efficiently as possible. The stakes are too high to allow any less.

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ACKNOWLEDGMENTS

Financial support for the study was secured from many sources. Generally, each participating state provided assistance to complete its own study. Other funds came from: the Ford Foundation, Rockefeller Brothers Fund, Piton Foundation (Colorado), Gates Foundation (Colorado), the University of Missouri at Kansas City, the Coalition of Northeastern Governors, the Northeast-Midwest Institute, the Port Authority of New York and New Jersey, Cummins Engine Company, R.J. Reynolds Tobacco Company, Lehman Brothers Kuhn Loeb, Cleveland Foundation, Tennessee Valley Authority and the Joint Economic Committee of Congress.

All of the participating states provided outstanding staff support. Particular thanks, however, is due Ms. Nancy Rutledge of Washington State, and Melinda Luedtke of California, for their sustained involvement in the preparation of their states' case studies. Additionally, while the findings and conclusions of the report to the JEC are those of the University of Colorado's core staff and the National Infrastructure Advisory Committee, appreciation is due Jesse White, Southern Growth Policy Board; David Arnold, Coalition of Northeastern Governors; David Harrison, Northeast-Midwest Institute; and Jim Maddy, Western Governors Policy Office. Their counsel, at various times during this study, helped sharpen staff analyses. Special acknowledgment is also due Mr. Stephen Carlson of the Port Authority of New York and New Jersey for his sustained encouragement and numerous insights during the course of the Advisory Committee and staff deliberations and to Ms. Deborah Matz, project director of JEC, for her invaluable assistance in defining Congressional concerns and for her help in maintaining crucial liaison with Congress and participating states. Finally, a special thanks is due Mr. David Greenberg for his editorial help in converting a lengthy and complex analysis prepared for the JEC into a brief report to the American public.

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